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(58) Field of search

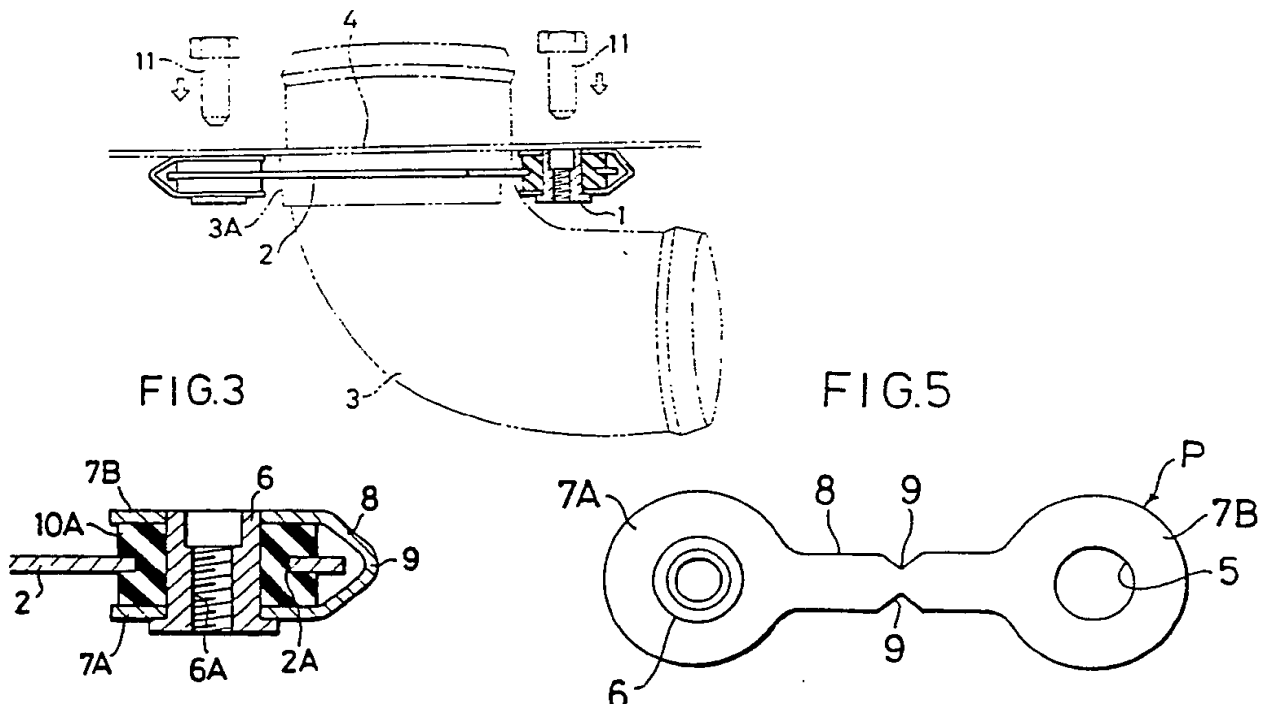
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(54) **Mounting plate with internal thread for car body fitting**

(57) A nut 6 is welded to one arm 7A of a mounting plate 8 which is bent to U-shape, the bending being facilitated by notches 9. A rubber block 10A is provided on the arm 7A and has a peripheral groove in which is received the open jaw 2A of a retainer plate 2 for holding an inlet pipe 3 for a car engine to a body panel 4.

FIG.1



At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

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FIG.1

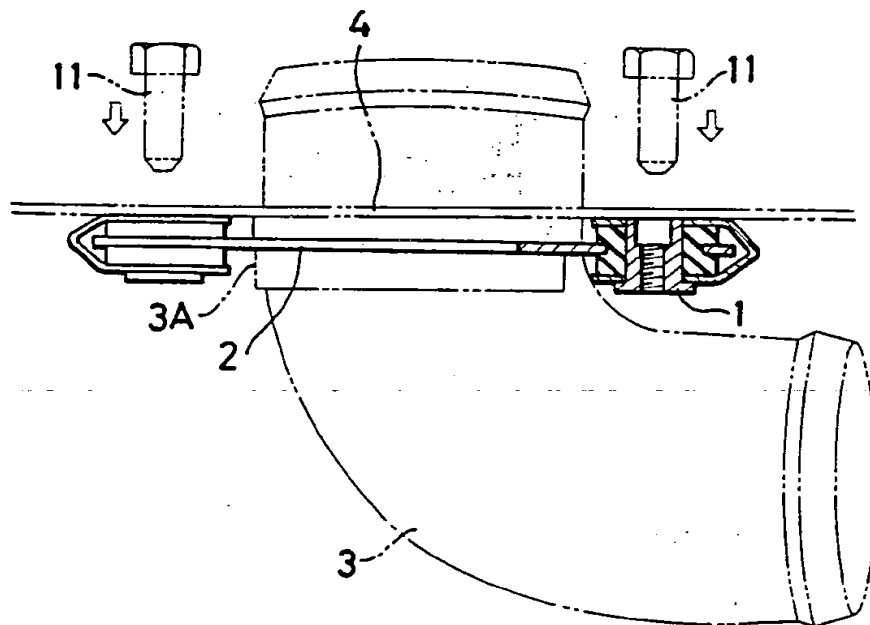


FIG.2

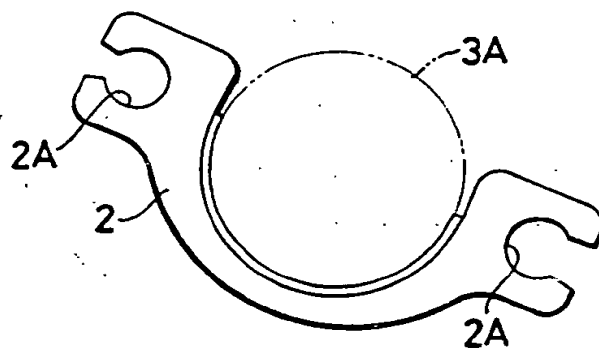


FIG.3

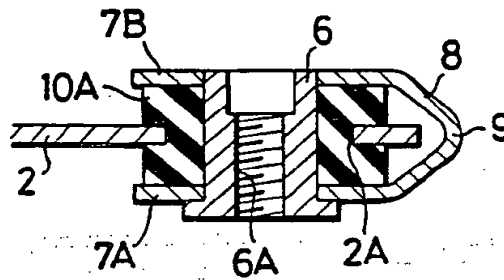


FIG.4

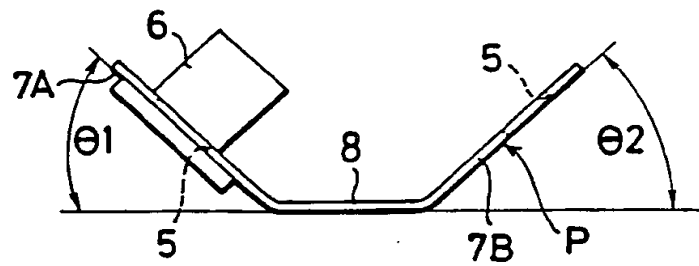


FIG.5

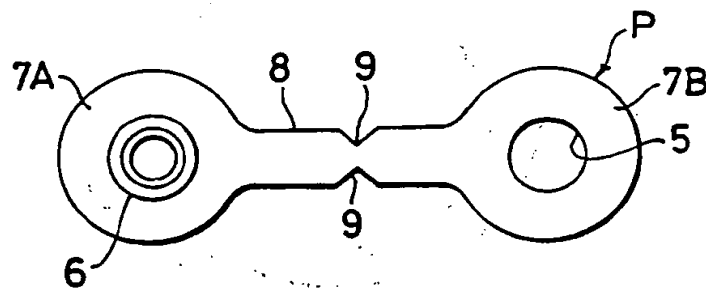


FIG.6

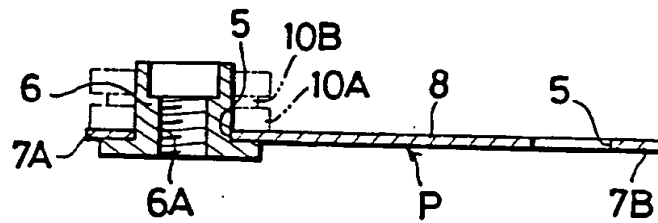
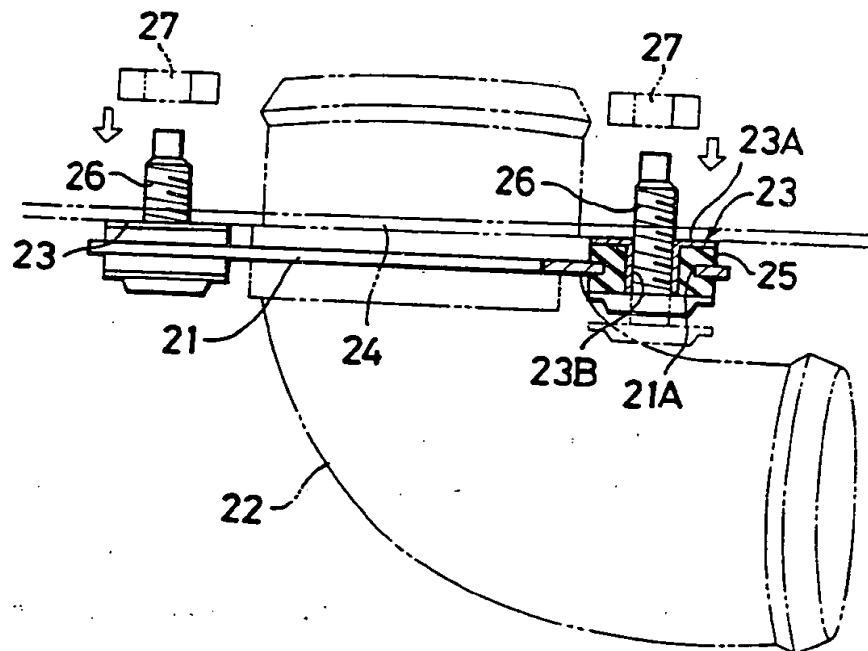


FIG.7



## S P E C I F I C A T I O N

TITLE OF THE INVENTION:

Mounting plate with internal thread for car body fitting

BACKGROUND OF THE INVENTION:

This invention relates to a mounting plate with internal thread for car body fitting.

Generally, in the fitting line at an automobile manufacturing plant, an engine and other components are attached to a body at each process. For example, an inlet pipe which is a part for the engine is fitted to the car body through a plate held by a mounting plate for car body fitting.

Such a mounting plate for car body fitting is known for example as seen in Fig. 7. In the drawing, 21 stands for a pipe retaining plate for holding an inlet pipe 22, 23 for a mounting plate, and 24 for a car body fitting panel. The mounting plate 23 consists of a ring member 23A and a cylindrical bending member 23B rising from the ring member 23A and is fitted in a slit 21A of the pipe retaining plate 21 through a rubber block 25.

And, at a certain process in the fitting line, the pipe retaining plate 21 holding the inlet pipe 22 is temporarily assembled with the body fitting panel 24, and a bolt 26 is inserted in the cylindrical bending member 23B of the mounting plate 23.

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In the after-process on the fitting line, nuts 27, 27 are screwed onto the bolts 26, 26 which are inserted into the mounting plates 23, 23, thereby fixing the pipe retaining plate 21 to the body fitting panel 24.

In the prior art, however, in the fitting line for automobiles where the mounting plate 23 is fixed to the body fitting panel 24, to screw the nut 27 onto the bolt 26 to fix the pipe retaining plate 21 to the body fitting panel 24, a worker screwing the nut 27 to fit onto the bolt 26 had difficulty in tightening the nut 27 to the bolt 26 because the bolt 26 inserted upward into the cylindrical bending section 23B of the mounting plate 23 was not supported by any means, and the bolt 26 tended to drop due to gravity, deteriorating workability.

As an exhaust pipe mounting plate, for example Japanese Utility Model Application Laid-open Nos. 59-168517 and 60-29982 are known. These applications are for the plate used to tighten an exhaust pipe and can not be applied as they are to attach the above inlet pipe 22 to the body fitting panel 24.

#### SUMMARY OF THE INVENTION:

The present invention has been completed to remedy the above disadvantages and its object is to provide a mounting plate with internal thread for car body fitting which can improve workability of screw holding when the mounting plate is screw-fixed to the car body in the fitting line for auto-

mobile.

To accomplish the above object, the present invention provides a pair of mounting sections which has an internal thread in one of them and a plate member having a certain width integrally formed with said mounting sections to connect the both mounting sections, this plate member being provided with a bending portion which has stiffness weaker than that of the remaining portion, and the plate member is bent at the bending portion to oppose the both mounting sections to each other.

In the present invention, at a certain process in the fitting line, the mounting plate with internal thread for car body fitting is temporarily attached to the car body. In this state, the inside threaded hole of the mounting section falls in the state retained by and formed on the body. And, at the after-process in the fitting line, when the bolt is driven to be secured into the above internal threaded hole to fix the above mounting plate with internal thread for car body fitting, the bolt can be driven downward into the internal threaded hole of the mounting section.

BRIEF DESCRIPTION OF THE DRAWINGS:

Fig. 1 is a partial cross section of the mounting plate with internal thread for car body fitting according to the embodiment of this invention.

Fig. 2 is a plan view of the pipe retaining plate of Fig. 1.

Fig. 3 is a detailed cross section of the main part of Fig. 1.

Fig. 4 is a side view illustrating the mounting plate with internal thread for car body fitting before working according to the embodiment of this invention.

Fig. 5 is a plan view illustrating the mounting plate with internal thread for car body fitting before working according to the embodiment of this invention.

Figs. 6 is a cross section of Fig. 5.

Figs. 7 is a partial cross section illustrating the conventional mounting plate as fitted.

#### DESCRIPTION OF THE PREFERRED EMBODIMENT:

The present invention will be described by the examples with reference to the drawings.

Fig. 1 to Fig. 6 illustrate the configuration of the mounting plate with internal thread for car body fitting.

Fig. 1 shows that the mounting plate with internal thread for car body fitting according to this invention is temporarily attached to the body at a certain process in the fitting line, wherein reference number 1 stands for the mounting plate with internal thread for car body fitting according to this invention, 2 for a pipe retaining plate for



holding the vertical section 3A of an inlet pipe 3, and 4 for a body fitting panel.

In Fig. 3 to Fig. 6, the mounting plate with internal thread for car body fitting 1 of the present invention has a pair of mounting sections 7A, 7B which has through holes 5, 5, and one of them is welded with a projection nut 6 and a plate member 8 with a certain width integrally formed with the mounting sections 7A, 7B to connect the both mounting sections 7A, 7B. This plate member 8 is provided with bending portions 9, 9 which have stiffness weaker than that of the remaining portion, and the both mounting sections 7A, 7B are bent at about the bending portions connecting the both mounting sections 7A, 7B and the plate member 8 is being bent so as to oppose the both mounting sections 7A, 7B to each other. The projection nut 6 is provided with an internal threaded hole 6A.

Then, the mounting plate with internal thread for car body fitting 1 of this example will be described according to its production process.

In Fig. 4 to Fig. 6, the both mounting sections 7A, 7B are integrally formed using a panel material P as a material, and the both sides of the center of the plate member 8 is notched to form 90-degree bending sections 9, 9 which have stiffness weaker than that of the remaining portion.

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Then, each connecting portion between the plate member 8 and the both mounting sections 7A, 7B is bent toward the same direction by a bending work. In this case, the bending angles  $\theta 1$  and  $\theta 2$  are  $45^\circ$ .

Then, the projection nut 6 is welded to be fixed to the through hole 5 of the mounting section 7A.

As shown in Fig. 6, a mounting rubber block 10A is fit on the projection nut 6. Then, the both mounting sections 7A, 7B are pressed so as to oppose to each other, thereby bending at the bending sections 9, 9 provided at the center of the plate member 8. Further pressing them continuously results in providing the shape as shown in Fig. 3. Even if it is released from hands, the bending portions 9, 9 do not resume to the original shape.

Notched holes 2A, 2A (shown in Fig. 2) of the pipe retaining plate 2 are fit on the outer periphery of the circular groove 10B (shown in Fig. 6) of the mounting rubber block 10A provided on the mounting section 7A, and an inlet pipe 3 being held by the pipe retaining plate 2 is temporarily fitted to the body fitting panel 4 at a certain process in the fitting line.

At the after-process in the fitting line, a bolt 11 is driven into the internal thread 6A of the mounting section 7A of the above mounting plate with internal thread for car

body fitting 1 to fix the pipe retaining plate 2 to the body fitting panel 4.

The present example will be described by its functions and effects.

As described above, at a certain process in the fitting line, the pipe retaining plate 2 fitted to the above mounting plate with internal thread for car body fitting 1 is temporarily fitted to the body fitting panel 4. With this state, the internal threaded hole 6A of the projection nut 6 of the mounting section 7A is held by and formed to the body fitting panel 4, and at a after-process, when a bolt 11 is screwed into the above internal threaded hole 6A to fix the above mounting plate with internal thread for car body fitting 1 to the body fitting panel 4, the bolt 11 can be screwed downward.

Thus, the bolt 11 can be securely driven downward into the internal threaded hole 6A of the mounting section 7A, remedying a drawback that the bolt 26 drops as seen in the conventional embodiment shown in Fig. 7 and improving the workability in driving the bolt 11 in.

In bending the above plate member 8 at the bending portions 9, 9, the both mounting sections 7A, 7B have been bent in advance at a certain angle as shown in Fig. 4, so that when the bending portions 9, 9 are bent, the both mounting sections 7A, 7B come to approach to each other and

no needless movement is required, thus providing much more accurate contact of the both mounting sections 7A, 7B. Further, since the bending portions 9, 9 which were once bent substantially do not have a restoring force, no force is applied in the direction that the contacted mounting sections 7A, 7B are separated, and therefore the once contacted mounting sections 7A, 7B do not open and are free from dropping out.

Further, since the plate member 8 can be bent at the bending portions 9, 9, driving the bolt 11 does not induce a trouble such that the bolt 11 interferes with the through holes 5, 5 due to the miss alignment of the opposing through holes 5, 5 of the mounting sections 7A, 7B thereby being able to improve workability.

In addition, when the bolt 11 is screwed into the internal threaded hole 6A of the projection nut 6, the projection nut 6 can be prevented from running idle because the plate member 8 which is likely to be turned by the rotating force of the projection nut 6 is contacted with the pipe retaining plate 2.

This example referred to a case that the projection nut 6 was welded to the mounting section 7A. But the projection nut 6 is not always required as far as the internal thread is formed. For example, the mounting section 7A is provided

with a cylindrical bending section by pressing, and the internal thread is formed in the cylindrical bending section.

This example also formed the notches at an angle of  $90^\circ$  in the bending portions 9, 9 of the plate member 8, but since they are formed in order to make the bending easier, they may be notched in the form of a polygon, a circle or the like, for example.

As described above, in this invention, to drive the bolt into the internal threaded hole of the fitting portion at the after-process following temporarily attaching the above mounting plate with internal thread for car body fitting in the fitting line, the bolt can be securely driven downward into the internal threaded hole of the clamp member because the internal threaded hole of the fitting portion is retained by and formed to the car body. Consequently, this invention can remedy a disadvantage that the bolt drops out as in the conventional embodiment and improve the workability in driving the bolt.

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WHAT IS CLAIMED IS:

(1) A mounting plate with internal thread for car body fitting characterized by a pair of mounting sections which has an internal thread in one of them and a plate member having a certain width which is integrally formed with said mounting sections to connect the both mounting sections, said plate member being provided with a bending portion which has stiffness weaker than that of the remaining portion, and the plate member is bent at the bending portion to oppose the both mounting sections to each other.

(2) A mounting plate with internal thread for car body fitting according to Claim 1, wherein said pair of mounting sections has a through hole respectively and one of said holes has in its inside an internally threaded projection nut welded.

(3) A mounting plate with internal thread for car body fitting according to Claim 2, wherein said projection nut is fitted with a circular recess for receiving a plate for holding a part to be fixed to a car body.

(4) A mounting plate with internal thread for car body fitting according to Claim 1, wherein said bending portion is formed by providing notches in the both sides of the plate member.

(5) A mounting plate with internal thread for car body fitting substantially as hereinbefore described with reference to Figures 1 to 6 of the accompanying drawings.